

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Page 2 of 13

IN THE CLAIMS:

1. (Currently Amended) A system for delivering a polishing fluid to a chemical mechanical polishing surface comprising:

a rotating polishing material having an upwardly facing polishing surface for polishing a substrate thereon;

an arm having a delivery portion disposed at least partially over the polishing surface;

a first nozzle disposed on the delivery portion and adapted to flow the polishing fluid at a first rate to a first zone defined on the polishing surface of the polishing material; and

at least a second nozzle disposed on the delivery portion and adapted to flow the polishing fluid at a second rate that is different than the first rate to a second zone defined on the polishing surface of the polishing material; wherein the first nozzle dispenses a greater volume of polishing fluid on ~~a first portion~~ the first zone of the polishing surface as it interfaces with the substrate than the polishing fluid of equal concentration dispensed on ~~a second portion~~ the second zone of the polishing surface by the second nozzle.

2. (Original) The system of claim 1 further comprising a flow control device coupled to the first nozzle.

3. (Original) The system of claim 2 further comprising a second flow control device coupled to the second nozzle.

4. (Original) The system of claim 2, wherein the flow control device is a flow control selected from the group consisting of orifices, needle valves, proportional valves, pinch valves, restrictors, mass flow controllers and a metering pumps.

5. (Original) The system of claim 1, wherein the arm further comprises a polishing fluid delivery line coupled to both the first and second nozzle.

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Page 3 of 13

6. (Original) The system of claim 1 further comprising a first fluid source coupled to the first nozzle and a second fluid source coupled to the second nozzle.
7. (Original) The system of claim 1 further comprising a plurality of nozzles adapted to flow polishing fluid at a controlled rate.
8. (Original) The system of claim 7, wherein each nozzle is independently controllable.
9. (Original) The system of claim 1 further comprising a rotating platen adapted to support a polishing material, the polishing material comprising the polishing surface.
10. (Original) The apparatus of claim 9, wherein the polishing material is a polyurethane pad or a fixed abrasive pad.
11. (Original) The system of claim 10, wherein the polishing material is a web of fixed abrasive.
12. (Original) The system of claim 1, wherein the first nozzle is disposed radially inward of the second nozzle relative to a center of rotation of the polishing pad, and wherein the first flow is at least 1.15 time greater than the second flow.
13. (Original) The system of claim 1, wherein first flow is at least 1.15 times the second flow rate.
14. (Original) The system of claim 1, wherein first flow is about 1.2 to about 20 times the second flow rate.

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Page 4 of 13

15. (Original) The system of claim 1 further comprising a metrology device adapted to provide information utilized to control at least one of the flows through the nozzles.

16. (Previously Amended) A system for delivering a polishing fluid to a chemical mechanical polishing surface comprising:

a polishing surface adapted to polishing a substrate in contact therewith;

an arm having a delivery portion disposed at least partially over the polishing surface;

a first means for providing polishing fluid to the polishing surface at a first rate; and

a second means for providing polishing fluid to the polishing surface at a second rate, wherein the first means flows a greater volume of polishing fluid on a first portion of the polishing surface as it interfaces with the substrate than the polishing fluid of equal concentration disposed on a second portion of the polishing surface by the second means.

17. (Original) The system of claim 16, wherein the first and second means are independently controllable.

18. (Original) The system of claim 16 further comprising one or more additional means for providing polishing fluid to the polishing surface disposed between the first means and the second means.

19. (Currently Amended) A system for delivering a polishing fluid to a chemical mechanical polishing surface comprising:

a platen supporting the polishing surface;

a polishing head disposed over the platen and adapted to hold a substrate against the polishing surface;

an arm having a delivery portion disposed at least partially over the polishing surface;

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Pag 5 of 13

a first nozzle disposed on the delivery portion and adapted to flow the polishing fluid at a first rate to a first portion of the polishing surface; and

at least a second nozzle disposed on the delivery portion and adapted to flow the polishing fluid at a second rate that is different than the first rate to a second portion of the polishing surface, wherein the polishing fluid flowed on the first portion has a greater volume as it interfaces with the substrate than the polishing fluid of equal concentration flowed on the second portion by the second nozzle when the fluid on the second portion interfaces with the substrate.

20. (Original) The system of claim 19, wherein at least the first flow is controllable.

21. (Original) The system of claim 20, wherein the second flow is controllable.

22. (Original) The system of claim 19 further comprising a metrology device adapted to provide information utilized to control at least one of the flows through the nozzles.

23. (Previously Presented) A method of supplying a polishing fluid to a chemical mechanical polishing surface comprising:

flowing polishing fluid onto a first portion of a rotating polishing pad at a first rate; and

flowing polishing fluid of equal concentration on a second portion of the polishing pad at a second rate that is different than the first rate, wherein the polishing fluid disposed on the first portion has a greater volume as it interfaces with a substrate being polished than the polishing fluid disposed on the second portion.

24. (Original) The method of claim 23, wherein the first rate is independently controllable relative the second rate.

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Page 6 of 13

25. (Previously Presented) The method of claim 23 further comprising:
flowing the polishing fluid on the pad at one or more locations between the first portion and the second portion.
26. (Original) The method of claim 23, wherein the step of flowing the polishing fluid at a first rate further comprises:
adjusting the flow rate during polishing.
27. (Original) The method of claim 26, wherein the step of adjusting further comprises:
adjusting the flow rate in response to a polishing metric.
30. (Previously Presented) A system for delivering a polishing fluid to a chemical mechanical polishing surface comprising:
a rotating polishing material having an upwardly facing polishing surface for polishing a substrate thereon;
an arm having a delivery portion disposed at least partially over the polishing surface;
a first nozzle coupled to the delivery portion and supported over a first zone defined on the polishing material by a volume of polishing fluid provided by the first nozzle; and
at least a second nozzle coupled to the delivery portion and supported over a second zone defined on the polishing material by a volume of polishing fluid provided by the second nozzle that is different than the volume provided to the first zone, wherein the polishing fluid in the first zone and the second zone have equal concentration when rotated into contact the substrate.
31. (Previously Presented) A system for delivering a polishing fluid to a chemical mechanical polishing surface comprising:
a rotating polishing material having an upwardly facing polishing surface for polishing a substrate thereon;

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Page 7 of 13

a first zone defined on the polishing material having a first volume of polishing fluid disposed thereon;

a second zone defined on the polishing material radially inward of the first zone and having a volume of polishing fluid disposed thereon that is different than a volume of polishing fluid of the same concentration disposed on the first zone when contacting the substrate positioned on the polishing material; and

an arm having a first nozzle and a second nozzle coupled thereto, the first nozzle positioned to deliver a first flow of polishing fluid to the first zone, and the second nozzle positioned to deliver a second flow of polishing fluid to the second zone that is different than the first flow.

32. (Previously Presented) The system of claim 31 further comprising a flow control device coupled to at least one of the first or second nozzles.

33. (Previously Presented) The system of claim 32, wherein the flow control device is a flow control selected from the group consisting of orifices, needle valves, proportional valves, pinch valves, restrictors, mass flow controllers and metering pumps.

34. (Previously Presented) The system of claim 31, wherein the arm further comprises a polishing fluid delivery line disposed within the arm coupling the first and second nozzles.

35. (Previously Presented) The system of claim 31 further comprising a first fluid source coupled to the first nozzle and a second fluid source coupled to the second nozzle.

36. (Previously Presented) The system of claim 31 further comprising a plurality of independently controllable nozzles coupled between the first and second nozzles, the independently controllable nozzles adapted to flow polishing fluid at a controlled rate.

RESPONSE TO FINAL OFFICE ACTION
S/N 09/921,588
Page 8 of 13

37. (Previously Presented) The system of claim 31, wherein first flow is at least 1.15 times the second flow rate.

38. (Previously Presented) The system of claim 31, wherein first flow is about 1.2 to about 20 times the second flow rate.

39. (Previously Presented), The system of claim 31 further comprising a metrology device adapted to provide information utilized to control at least one of the flows through the nozzles.